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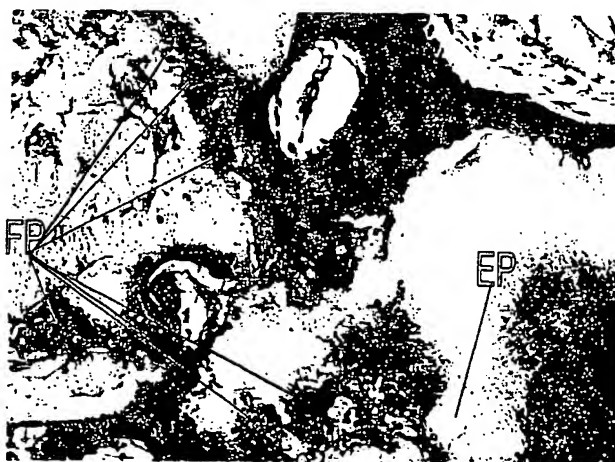
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LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
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NE, SN, TD, TG).

[Continued on next page]

(54) Title: POROUS BETA-TRICALCIUM PHOSPHATE GRANULES AND METHODS FOR PRODUCING SAME



(57) Abstract: A porous  $\beta$ -tricalcium phosphate material for bone implantation is provided. The multiple pores in the porous TCP body are separate discrete voids and are not interconnected. The pore size diameter is in the range of 20-500  $\mu$ m, preferably 50-125  $\mu$ m. The porous  $\beta$ -TCP material provides a carrier matrix for bioactive agents and can form a moldable putty composition upon the addition of a binder. Preferably, the bioactive agent is encapsulated in a biodegradable agent. The invention provides a kit and an implant device comprising the porous  $\beta$ -TCP, and a bioactive agent and a binder. The invention also provides an implementable prosthetic device comprising a prosthetic implant having a surface region, a porous  $\beta$ -TCP material disposed on the surface region optionally comprising at least a bioactive agent or a binder. Methods of producing the porous  $\beta$ -TCP material and including bone formation are also provided.

WO 02/070029 A3

**Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SI, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SI, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 02/05827

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 A61L27/12 A61L27/56

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, FSTA, INSPEC, COMPENDEX

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 323 083 A (ASAHI OPTICAL CO LTD) 16 September 1998 (1998-09-16)  page 2, paragraph 2 -page 3, paragraph 2 page 5, paragraph 2 -page 6, paragraph 2 page 7, paragraph 3 -page 8, paragraph 1 page 9, paragraph 2 ---	1-17, 31-33, 37, 38, 40-43, 52-54, 56-63
X	US 4 596 574 A (URIST MARSHALL R) 24 June 1986 (1986-06-24)  column 2, line 3 - line 44 column 3, line 45 -column 4, line 27 --- -/--	1-6, 11-17, 31-33, 40-43,52

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*A\* document member of the same patent family

Date of the actual completion of the international search

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# INTERNATIONAL SEARCH REPORT

Int. Patent Application No.  
PC 1/US 02/05827

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>US 4 869 906 A (DINGELDEIN ELVIRA DR ET AL) 26 September 1989 (1989-09-26)</p> <p>column 1, line 50 -column 2, line 56 column 2, line 63 -column 3, line 35 column 4, line 42 - line 64 claims 1-7</p>	<p>1-6, 11-15, 21,31, 34-36, 40,41, 44-47, 56-63</p>
X	<p>US 5 422 340 A (ONGPIPATTANAKUL BOONSRI ET AL) 6 June 1995 (1995-06-06)</p> <p>column 8, line 38 - line 54 column 9, line 58 -column 10, line 60 column 15, line 41 - line 66 column 16, line 21 - line 58</p>	<p>1-17,19, 20, 22-33, 35-43, 45,46, 48-55, 80-85</p>
X	<p>WO 01 13970 A (DINKELAKER ALBRECHT ;PABST JOACHIM (DE); HEIDE HELMUT (DE); POBANT) 1 March 2001 (2001-03-01) page 6, paragraph 2 -page 7, paragraph 2 page 8, paragraph 1 -page 9, paragraph 3 page 10, paragraph 2 -page 11, paragraph 2</p>	<p>1-14,40</p>
X	<p>US 5 135 394 A (IRIE HIROYUKI ET AL) 4 August 1992 (1992-08-04) column 2, line 10 - line 44 column 3, line 6 - line 67 claims 1-9</p>	<p>1-12,40, 56-69</p>

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 02/05827

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 70-79  
because they relate to subject matter not required to be searched by this Authority, namely:  
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

Claims 70-79 are directed to a method of treatment of the human/animal body. Therefore, the search has not been carried out for those claims.

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Continuation of Box I.1

Claims Nos.: 70-79

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy

# INTERNATIONAL SEARCH REPORT

Information on patent family members

In International Application No  
PCT/US 02/05827

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